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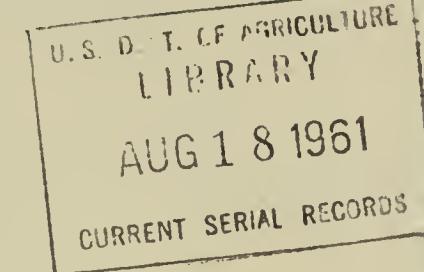
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TECHNICAL NOTES

LAKE STATES FOREST EXPERIMENT STATION
U.S. DEPARTMENT OF AGRICULTURE · · FOREST SERVICE

No. 605

Season of Logging Unimportant in Creating Disturbed Seedbeds for Yellow Birch



For effective seedling establishment, yellow birch requires a disturbed seedbed where mineral soil is present. It has often been suggested that sufficient seedbed scarification could be obtained by logging during the summer. The normal practice, however, is to harvest yellow birch and associated species during the winter when the ground is snow covered. But just how much scarification can be expected from logging selectively marked stands with different snow depths present?

To answer this question, the Lake States Forest Experiment Station began a study in Upper Michigan in 1957 to observe the effects of season of logging upon seedbed disturbance. The results were obvious: Summer logging provided greater scarification than did fall or winter logging. But the important point is that, except for skidways, disturbed seedbeds occurred on only 17 percent of the area even with no snow present. Furthermore, only 10 percent of the area was considered suitable for the establishment of yellow birch.

This study was established in an old-growth stand in the hemlock-yellow birch type. The principal species were eastern hemlock, yellow birch, sugar maple, and red maple. The site was flat and wet, which made logging more difficult during summer than winter.

Two replications were established, each containing three rectangular 5-acre plots. The timber on each of these plots was selectively marked to leave a thrifty residual stand of 90 square feet of basal area per acre in trees over 9.5 inches d.b.h. Except for one heavily stocked plot the gross volume cut ranged from 2600 to 3600 board feet per acre and averaged 3000 board feet.

In each replication one 5x10-chain plot was logged in the fall when the snow depth averaged 5 inches. Another was logged in the winter when the average snow depth was 18 inches. The remaining plot in each replication was harvested in the summer. Logs were ground-skidded with an HD-5 tractor to a skidway located at the narrow end of each 5-acre plot.

Sampling transects were placed at 1-chain intervals perpendicular both to the long axis of the plot and to the direction of skidding. Each square foot along these transects was examined after logging and placed in one of the following categories:

1. Moss
2. Hardwood leaf
- 2a. Conifer leaf
3. Grass or sedge
4. Bark or sawdust
5. Live tree
6. Hardwood leaf disturbed
8. Fresh bolt or stump
9. Mixed mineral soil and organic matter (50-50)
10. Mineral soil

Although seedbed classes 6, 9, and 10 were disturbed by logging, only classes 9 and 10 were considered favorable for the establishment of yellow birch. Table 1 shows that acceptable birch seedbeds occurred on only 2 percent of the area in winter-logged plots, on 6 percent of the area in fall-logged plots, and on 10 percent of the area for plots logged in the summer. Skidways were excluded from these computations because of the great disturbance caused by decking the logs.

Table 1.--Proportion of total seedbed disturbed by logging during different seasons

| Seedbed type | Percent | Percent | Percent |
|---|------------------------|---------------------------|--------------------|
| | Fall, snow depth 5" | Winter, snow depth 18" | Summer, no snow |
| (6) | | | |
| Disturbed leaf | 3.8 | 3.4 | 7.6 |
| (9) + (10) | | | |
| Mixed organic and mineral, or mineral soil | 5.9 | 1.8 | 9.6 |
| (6) + (9) + (10) | | | |
| Total disturbed seedbed | 9.7 | 5.2 | 17.2 |

From this study it is evident that season of logging affects seedbed disturbance, but insufficient scarification is obtained from logging regardless of the season in which it is done. If our aim is to enhance the establishment of yellow birch, we should rely on specific treatments for seedbed disturbance rather than on logging. A similar recommendation was made following a study of logging scarification in the Northeast.^{1/} The slight increase in favorable seedbeds obtained by summer logging is not worth the extra troubles associated with logging moist sites at this season.

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^{1/} Marquis, David A., and Bjorkbom, John C. How much scarification from summer logging? U.S. Forest Serv., Northeast. Forest Expt. Sta., Forest Res. Note 110, 3 pp., illus. 1960.